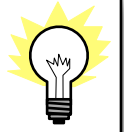




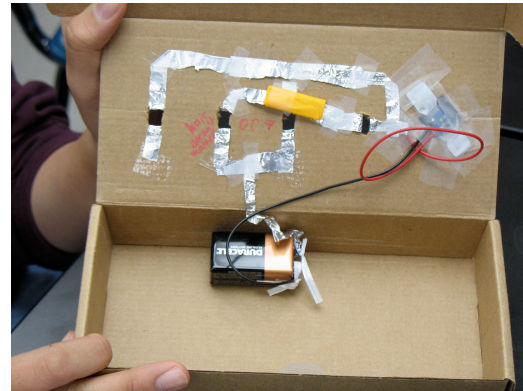
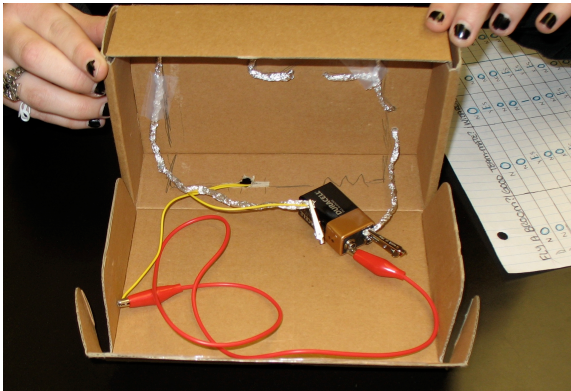
Science, Technology, & More!



Marking Period Two

Decision-Making Machine

Much of our modern technology is a "black box." This expression refers to the fact that most of the operations happen out of sight of the user. We push the buttons on the remote, and the TV channel changes. How does pushing a button change a channel? The average user doesn't know. When the "Check Engine" light goes on, how does the car "know" that something is wrong? In each case, a set of sensors send a signal to a microprocessor, which is programmed to react to different combinations of inputs. Someone has the job of thinking through all of the possible combinations of possibilities. This logical analysis results in a computer program, which then gets translated into an electrical circuit that actually does the job.



Your assignment is to build a Decision-Making Machine that uses battery power to produce an output (sounding an alarm, lighting a bulb, moving a motor, or some other electrical output approved by Mr. Cox).

- ◆ The device must have four input switches clearly labeled with binary questions.
- ◆ The device must be in a closed container, with only the switches visible.
- ◆ When demonstrated to the class, the device will yield an "on" or "off" output depending on the answers of the tester.
- ◆ These outputs should be logically connected to a scenario of your choosing.
- ◆ You may work alone or with one other person taking Mr. Cox's Science & Technology class.
- ◆ Your Machine must incorporate four input switches, one electrical output, and a logical connection among them.
- ◆ It must be no larger than 25cm x 25cm x 25cm.

You must show a logic diagram for the Device on Friday, December 18.

You must show a wiring diagram for the Device on Tuesday, December 22.

You must demonstrate the Device in class on Friday, January 15.

Your grade will be determined based on the rubric found on the back of this page. Here's a quick summary:

- ◆ Did you submit a logic diagram, a wiring diagram, and a project on time? (Your project must be delivered on time, even if you are absent from school, because we'll all be counting on you!)
- ◆ Does the Device use four logical binary input questions?
- ◆ Does the Device yield one logical binary electrical output?
- ◆ Is the Device, and the scenario behind it, unique and personal? (You should be able to construct the device with "junk-drawer" parts.)

RUBRIC FOR DECISION-MAKING MACHINE

PLANNING AND REFLECTION					
A: Planning	The Logic Diagram was submitted on-time.	The Logic Diagram included all required inputs and outputs.	The Electrical Circuit was submitted on-time.	The Electrical Circuit included all required switches and components.	The Electrical Circuit matched the logic shown in the Logic Diagram.
B: Completion	Project was delivered to school on-time.	Project required no more than five minutes of final preparation prior to demonstration.	Project was made entirely of "junk-drawer" parts.	Project was no larger than 25 cm x 25 cm x 25 cm.	Project accomplished its goal for at least two testers.
C: Interest	Project was based on an interesting scenario.	Project output showed uniqueness	Project operated in a manner that created suspense.	Project container had unique properties.	Project inputs were creatively designed.
D: Logic	The logic employed at least one OR condition.	The logic employed at least one AND condition.	The OR conditions were logical alternatives.	The AND conditions were logical requirements.	A Truth Table was provided that matched the results of the testers.
E: Reflection	Five points are awarded for a written review of the project after it has been demonstrated in class (details on this assignment to follow).				

SCIENTIFIC UNDERSTANDING AND EXECUTION		The binary conditions were clearly expressed.	The binary conditions worked as designed.
F: Input 1			
G: Input 2			
H: Input 3			
I: Input 4			
J: Output			

Total Score: (Out Of 40 Available)